

**Notice of Allowability**

Application No.

09/874,434

Examiner

José A Fortuna

Applicant(s)

ZHONG ET AL.

Art Unit

1731

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed on 6/4/01.
2. ☒ The allowed claim(s) is/are 1-3,5-12,14-20 and 22.
3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
(a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☒ CORRECTED DRAWINGS must be submitted.  
(a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☒ hereto or 2) ☐ to Paper No. \_\_\_\_\_.  
(b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.  
(c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)               |
| 3 <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 4 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>0903</u> |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____               | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment                       |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance      |
|  | 9 <input type="checkbox"/> Other   |

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Glen D. Barnes on September 09, 2003.

The application has been amended as follows:

#### **TITLE**

The Title has been changed as follows:--High-density plasma deposition process for fabricating a top clad for planar lightwave circuit devices—

#### **SPECIFICATION**

In page 4, line 17, after "11," --as shown in figure 1—has been added.

#### **CLAIMS**

Claim 1 (Amended). A method for performing high aspect ratio gap fill during planar lightwave circuit top clad deposition, the method comprising the steps of:

- a) forming a plurality of waveguide cores on a substrate, the waveguide cores having a plurality of gaps there between; and
- b) forming a cladding layer over the waveguide cores and the substrate using an HDP (high-density plasma) deposition process, the cladding layer having a lower refractive index than the waveguide cores;

wherein the aspect ratio of the gaps between the waveguide cores is greater than

3.

Claim 10 (Amended). 10. A method of making an optical waveguide for a planar lightwave circuit, the method comprising the steps of:

- a) forming a bottom cladding on a silicon substrate;
- b) forming a waveguide core layer on the bottom cladding, the waveguide core layer having a higher refractive index than the bottom cladding;
- c) forming a plurality of waveguide cores from the waveguide core layer, the waveguide core, having a plurality of gaps there between; and
- d) forming a top cladding over the waveguide cores using an HDP (high-density plasma) deposition process to form an optical waveguide of a planar lightwave circuit;

wherein the aspect ratio of the gaps between the waveguide cores is greater than 3.

Claim 19 (Amended). A method of making an AWG (arrayed waveguide grating) planar lightwave circuit, the method comprising the steps of:

- a) forming a bottom cladding on a substrate;
- b) forming a waveguide core layer on the bottom cladding, the waveguide core layer having a higher refractive index than the bottom cladding;
- c) forming a plurality of waveguide cores from the waveguide core layer, the waveguide cores having a plurality of gaps there between;

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- e) forming a HDP (high-density plasma) layer over the waveguide cores using an HDP deposition process to form an optical waveguide of an AWG planar lightwave circuit; and
- f) performing an anneal process after the HDP deposition process

wherein the aspect ratio of the gaps between the waveguide cores is greater than

3.

Claims 4, 13 and 21 have been cancelled.

2. The following is an examiner's statement of reasons for allowance: the prior art does not teach nor fairly suggested the high-density plasma deposition on waveguide cores having an aspect ratio gap greater than 3, as claimed. The aspect ratio gap has been defined in the specification as the ratio of the height of the cores and the separation distance between the cores, see page 12, lines 10-12: "As used herein, the term aspect ratio refers to the height of the cores 401-402 divided by the width of the gap 410 between them."

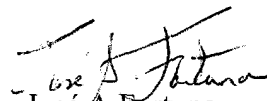
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José A Fortuna whose telephone number is 703-305-7498. The examiner can normally be reached on 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P. Griffin can be reached on 703-308-1164. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0662.

  
José A Fortuna  
Primary Examiner  
Art Unit 1731

JAF